MSP 200

User Manual

- Manual #: RGB-RD-UM-M200 E001
- Revision: V1.0

RGBlink

MSP 200·User Manual

Thank you for choosing our products!
In order to allow you to learn how to use the MSP 200 quickly, we bring you the detailed user Manual. You can read the introduction and directions before using the MSP 200, please read all the information we provide carefully to use our products correctly.

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Operators Safety Summary

The general safety information in this summary is for operating personnel.

Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

Terms in This Manual and Equipment Marking

WARNING

Highlight an operating procedure, practice, condition, statement, etc, which, if not strictly observed, could result in injury or death of personnel.

Note

Highlights an essential operating procedure, condition or statement.

CAUTION

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Amendment Records

The table below lists the changes to the MSP 200 User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2014-05-27	0001#	Release	Vira

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1. Brief Introduction

This chapter is designed to introduce you to the MSP 200 User Manual. Areas to be covered are:

- Chapter Structure
- How to Use The Manual
- Terms and Definitions
- System Overview
- Application Questions

Chapter Structure

The following chapters provide instructions for all aspects of MSP 200 operations.

Chapter 1 Brief Introduction

Chapter 2 Hardware Orientation

Chapter 3 Menu Orientation

Chapter 4 Communication Software Guideline

Appendix A Specification

Appendix B Contact Information

How to Use the Manual

Followings are important tips for streamlining your use of this User Manual in its electronic “PDF” form.

Navigation

Use Acrobat Reader’s “bookmarks” to navigate to the desired location. All chapter files have the same bookmark structure for instant navigation to any section. Please note:

- Extensive hyperlinks are provided within the chapters.
- Use Acrobat’s “**Go to Previous View**” and “**Return to next View**” buttons to trace your complete navigational path.

- Use the “**Previous Page**” and “**Next Page**” buttons to go to the previous or next page within a file.
- Use Acrobat’s extensive search capabilities, such as the “**Find**” tool and “**Search Index**” tool to perform comprehensive searches as required.

Table of Contents and Index

Use the Table of Contents bookmarks to navigate a desired topic. Click any item to instantly jump to that section of the guide. You can also use the **Index** to jump to specific topics within a chapter. Each page number in the **Index** is a hyperlink.

Should you have any questions regarding the installation or operation of MSP 200, please consult with the factory. Refer to Appendix B on page 37 for “Contact Information”.

Term and Definitions

The following terms and definitions are used throughout this guide.

- **"ASCII":** American Standard for Information Interchange. The standard code consisting of 7-bit coded characters (8 bits including parity check) used to exchange information between data processing systems, data communication systems, and associated equipment. The ASCII set contains control characters and graphic characters.
- **"Aspect ratio":** The relationship of the horizontal dimension to the vertical dimension of an image. In viewing screens, standard TV is 4:3, or 1.33:1; HDTV is 16:9, or 1.78:1. Sometimes the ":1" is implicit, making TV = 1.33 and HDTV = 1.78.
- **"AV":** Audio visual or audio video.
- A **"Background"** is an unscaled source, typically originating from a computer. A background source appears at the system's lowest priority — visually in back of all other sources.
- **"Baudrate"：** Named of J.M.E. Baudot, the inventor of the Baudot telegraph code. The number of the electrical oscillations per second, called baud rate. Related to, but not the same as, transfer rate in bits per second (bps).
- **"Blackburst":** The video waveform without the video elements. It includes the vertical sync, horizontal sync, and the chroma burst information. Blackburst is used to synchronize video equipment to align the video output. One signal is normally used to set up an entire video system or facility. Sometimes it is called House sync.
- **"BNC":** Bayonet Neill-Concelman. A cable connector used extensively in television and named for its inventors. A cylindrical bayonet connector that operates with a twist-locking motion. To make the connection, align the two curved grooves in the collar of the male connector with the two projections on the outside of the female collar, push, and twist. This allows the connector to lock into place without tools.
- **"Brightness":** Usually refers to the amount or intensity of video light produced on a screen without regard to color. Sometimes called "black level.
- "**CAT 5**": Category 5. Describes the network cabling standard that consists of four unshielded twisted pairs of copper wire terminated by RJ-45 connectors. CAT 5 cabling supports data rates up to 100 Mbps. CAT 5 is based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard.
- **"Color bars":** A standard test pattern of several basic colors (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly

- Used color bars are the SMPTE standard color bars. In PAL video, the most commonly used color bars are eight full field bars. In the computer, the most commonly used color bars are two rows of reversed color bars.
- **"Color burst":** In color TV systems, a burst of sub carrier frequency located on the back porch of the composite video signal. This serves as a color synchronizing signal to establish a frequency and phase reference for the chroma signal. Color burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.
- **"Color temperature":** The color quality, expressed in degrees Kelvin (K), of a light source. The higher the color temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark color temperature for the A/V industry includes 5000°K, 6500°K, and 9000°K.
- **"Contrast ratio":** The radio of the high light output level divided by the low light output level. In theory, the contrast radio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. In the CRT, light from adjacent elements contaminate the area of each element. Room ambient light will contaminate the light emitted from the CRT. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.
- **"DVI":** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.
- **"EDID":** Extended Display Identification Data – EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the optimal video format for the display based on the provided EDID data, ensuring proper video image quality. This communication takes place over the DDC – Display Data Channel.
- **"Ethernet":** A Local Area Network (LAN) standard officially known as IEEE 802.3. Ethernet and other LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, etc. within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10Mbps. For LAN interconnectivity, Ethernet is physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.
- **"Frame":** In interlaced video, a frame is one complete picture. A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still picture of a series that makes up a motion picture.

1. Brief Introduction

Terms and Definitions

- **“Gamma”:** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.
- **“HDMI” - High – Definition Multimedia Interface:** An interface used primarily in consumer electronics for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable. HDMI is the de facto standard for HDTV displays, Blu-ray Disc players, and other HDTV electronics. Introduced in 2003, the HDMI specification has gone through several revisions.
- **“HDSDI”:** The high-definition version of SDI specified in SMPTE-292M. This signal standard transmits audio and video with 10 bit depth and 4:2:2 color quantization over a single coaxial cable with a data rate of 1.485 Gbit/second. Multiple video resolutions exist including progressive 1280x720 and interlaced 1920x1080 resolutions. Up to 32 audio signals are carried in the ancillary data.
- **“JPEG” (Joint photographic Expects Group):** Commonly used method of loss compression for photographic images using a discreet cosine transfer function. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality. Produces blocking artifacts.
- **“MPEG”:** Motion Picture Expect Group. A standard committee under the auspices of the International Standards Organization working on algorithm standards that allows digital compression, storage and transmission of moving image information such as motion video, CD-quality audio, and control data at CD-ROM bandwidth. The MPEG algorithm provides inter-frame compression of video images and can have an effective compression rate of 100:1 to 200:1.
- **“NTSC”:** The color video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. A color signal must be compatible with black-and-white TV sets. NTSC utilizes an interlaced video signals, 525 lines of resolution with a refresh rate of 60 fields per second (60 Hz). Each frame is comprised of two fields of 262.5 lines each, running at an effective rate of 30 frames per second.
- **“Operator”:** Refers to the person who uses the system.
- **“PAL”:** Phase Alternate Line. A television standard in which the phase of the color carrier is alternated from line to line. It takes four full pictures (8 fields) for the color-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, in many transmission forms, is widely used in Western Europe,

Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-filed (25 fps) composite color transmission system.

- **"PIP":** Picture-in-Picture. A small picture within a larger picture created by scaling down one of the images to make it smaller. Each picture requires a separate video source such as a camera, VCR, or computer. Other forms of PIP displays include Picture-by-Picture (PBP) and Picture-with-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window.
- **"Polarity":** The positive and negative orientation of a signal. Polarity usually refers to the direction or a level with respect to a reference (e.g. positive sync polarity means that sync occurs when the signal is going in the positive direction).
- **"RJ-45":** Registered Jack-45. A connector similar to a telephone connector that holds up to eight wires used for connecting Ethernet devices.
- "**RS-232":** An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communication and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to the computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard.
- **"Saturation":** Chroma, chroma gain. The intensity of the color, or the extent to which a given color in any image is free from white. The less white in a color, the truer the color or the greater its saturation. On a display device, the color control adjusts the saturation. Not to be confused with the brightness, saturation is the amount of pigment in a color, and not the intensity. Low saturation is like adding white to the color. For example, a low-saturated red looks pink.
- **"Scaling":** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.
- **"SDI":** Serial Digital Interface. The standard based on a 270 Mbps transfer rate. This is a 10-bit, scrambled, polarity independent interface with common scrambling for both component ITU-R 601 and composite digital video and four channels of (embedded) digital audio.
- **"Seamless Switching":** A feature found on many video switchers. This

feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which normally is seen when switching between sources.

- **"SMPTE":** Society of Motion Picture and Television Engineers. A global organization, based in the United States that sets standards for base band visual communications. This includes film as well as video and television standards.
- **"S-Video":** A composite video signal separated into the luma ("Y" is for luma, or black and white information; brightness) and the chroma ("C" is an abbreviation for chroma, or color information).
- **"Sync":** Synchronization. In video, sync is a means of controlling the timing of an event with respect to other events. This is accomplished with timing pulses to insure that each step in a process occurs at the correct time. For example, horizontal sync determines exactly when to begin each horizontal scan line. Vertical sync determines when the image is to be refreshed to start a new field or frame. There are many other types of sync in video system. (Also known as "sync signal" or "sync pulse.")
- **"TCP/IP":** Transmission Control Protocol/Internet Protocol. The communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.
- **"USB":** Universal Serial Bus. USB was developed by seven PC and telecom industry leaders (Compaq, DEC, IBM, Intel, Microsoft, NEC, and Northern Telecom). The goal was easy plug-and-play expansion outside the box, requiring no additional circuit cards. Up to 127 external computer devices may be added through a USB hub, which may be conveniently located in a keyboard or monitor. USB devices can be attached or detached without removing computer power. The number of devices being designed for USB continues to grow, from keyboards, mice, and printers to scanners, digital cameras, and ZIP drives.
- **"VESA":** Video Electronics Standards Association. A nonprofit number organization dedicated to facilitating and promoting personal computer graphics through improved standards for the benefit of the end-user. www.vesa.org
- **"VGA":** Video Graphics Array. Introduced by IBM in 1987, VGA is an analog signal with TTL level separate horizontal and vertical sync. The video outputs to a 15-pin HD connector and has a horizontal scan frequency of 31.5 kHz and vertical frequency of 70 Hz (Mode 1, 2) and 60 Hz (Mode 3). The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using the 8514/A card (35.5 kHz, 86 Hz) in mode 4. It

has a pixel by line resolution of 640×480 with a color palette of 16 bits and 256,000 colors.

- **“YCrCb”:** Used to describe the color space for interlaced component video.
- **“YPbPr”:** Used to describe the color space for progressive-scan (non-interlaced) component video.

System Overview

MSP 200 is expecially designed for the audio and video system integration application engineer and designer, with its high quality and standardlization interface and resolution. User can use MSP 200 to test back end audio and video system by its fully equipped interfaces, and standard resolution support.

MSP 200 equips standard composite, component, VGA, DVI, HDMI and SDI interfaces, also supports analog L/R audio and H/S output for external Genlock reference signal.

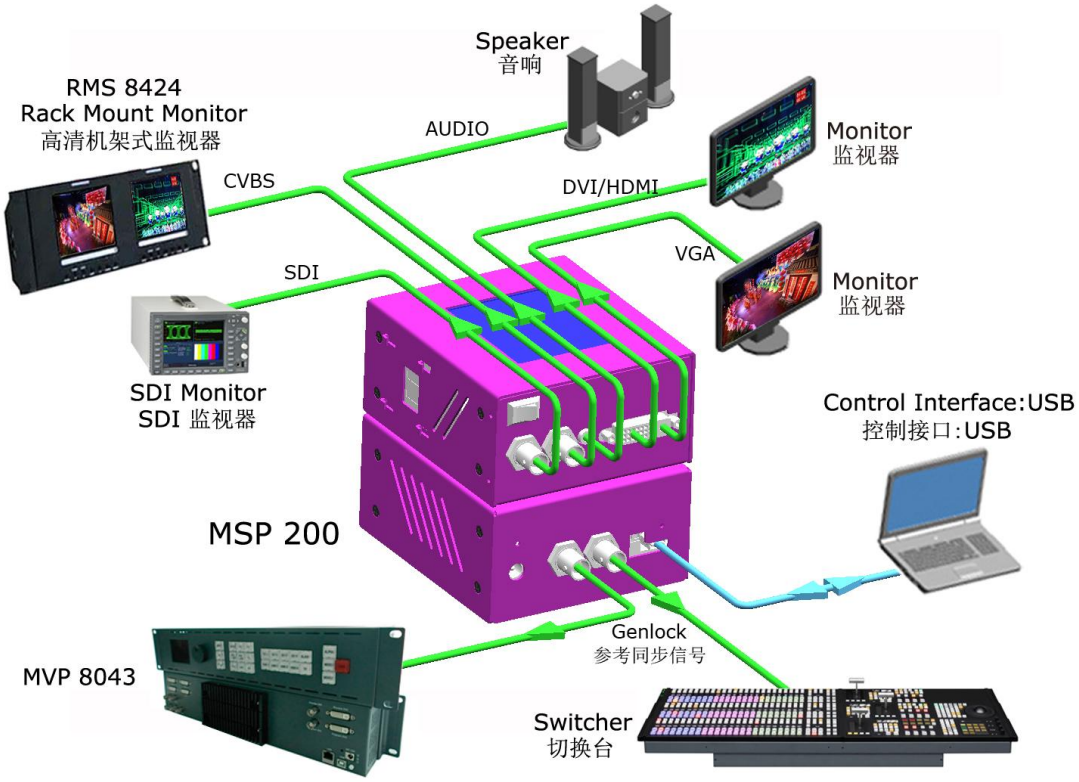
MSP 200 builds in all kinds of standard test patterns which compatible with SMPTE and VESA standards.

MSP 200 also embeds Time code for frame delay test application. It is fully operation by Touch Panel, and user can calibrate the touch panel in need.

MSP 200 can be power on by external power module and also can use battery. And external power module can charge battery too.

Application Questions

RGBlink offers solutions to demand technical problems. Any application questions, or required further information, please contact with our Customer Support Engineers. Refer to Appendix B for contact details.



2. Hardware Orientation

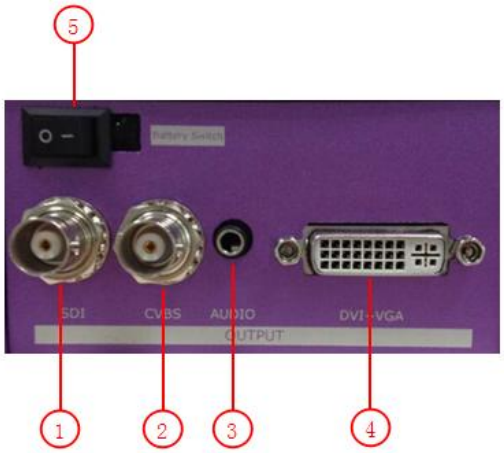
In This Chapter

This chapter provides detailed information about the MSP 200 hardware. The following topics are discussed:

- Interface Description

Interface Description

The figure below illustrates the professional interface of MSP 200.



1: SDI Output

SDI output interface, can connect the next level device with SDI interface.

2: CVBS Output

CVBS Output interface, can connect standard video signal from players, cameras etc.

3: Audio Output

Audio output, connect to the speakers or audio power amplifier system.

4: DVI +VGA DVI Output

DVI +VGA output via DVI connector connect to the monitor or LED screen which has DVI interface.

(This DVI connector does not support hot-plugging).

DVI +VGA, VGA output connector can be connected to monitor or projector which has VGA interface.

2. Hardware Orientation

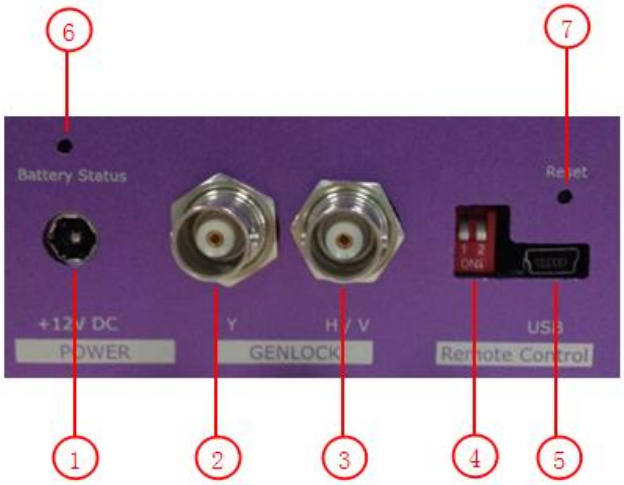
Interface Description

Via adapter, can connect with DVI-based or VGA-based equipment, and via DVI to VGA adapter, can output VGA only.

5: Switch

2. Hardware Orientation

Interface Description



1: Power

Use for battery charge, this device uses battery S-8972, LIB 7.2V, 6.6Ah 47wh, compatible with SONY NP-F970 NP-F770.

2. 3: Genlock Output

Genlock output interface, connect to the next level device with Genlock input.

4: Dial Switch

If the two dial switches are upwards, the device is in normal work, and if they are downwards, the device is in upgrade state.

5: USB Interface

Remote communication device controls interface, and is used to connect the computer.

6: Battery Status Indicator

When the battery is charging, the indicator light will glow.

When finish charging, the indicator light is off.

When plug into the power supply without battery, the indicator light flashes.

7: Reset Button

If the touch screen works improperly due to incorrect screen calibration, push Reset button to modify.

3. Menu Orientation

In This Chapter

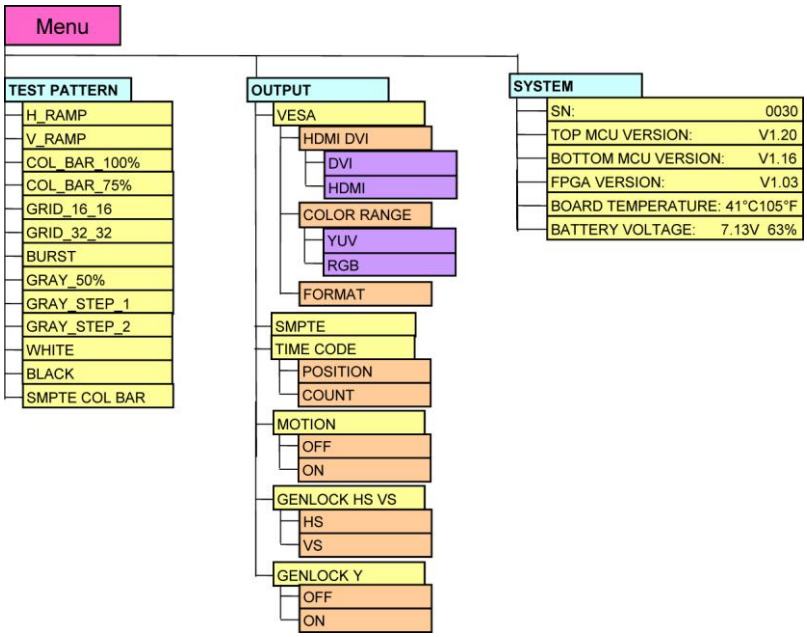
This chapter describes all MSP 200 menus, including the functions that are available, and descriptions of each menu tree (in block diagram format).

The following topics are discussed:

- **MENU**
  - TEST PATTERN
  - OUTPUT
  - SYSTEM

MENU

Touch on the touch screen to enter the menu items, touch the menu to enter corresponding setting or view the menu.



TEST PATTERN

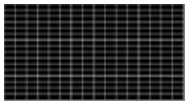
Choose [TEST PATTERN], the touch screen shows 13 kinds of test patterns as follows:

H_RAMP：

V_RAMP：

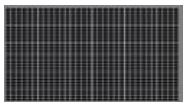
COL_BAR_100%：

COL_BAR_75%：

GRID_16_16： 

3. Menu Orientation

MENU

GRID_32_32： 

BURST：

GRAY_50%：

GRAY_STEP_1：

GRAY_STEP_2：

WHITE：

BLACK：

SMPTE COL BAR：

OUTPUT

Choose [OUTPUT], the touch screen shows level 2 menus as follows:

VESA: Include the following items:

HDMI DVI: User can choose HDMI or DVI.

COLOR RANGE: User can choose YUV or RGB.

FORMAT: This option includes 23 kinds of common output resolutions:

640x480@60, 640x480@75, 640x480@85, 800x600@60, 800x600@75, 800x600@85, 1024x768@60, 1024x768@75, 1024x768@85, 1280x800@60, 1280x1024@60, 1280x1024@75, 1280x1024@85, 1360x768@60, 1366x768@60, 1400x1050@60, 1440x900@60, 1600x1200@60, 1680x1050@60, 1920x1200@60, 2048x1152@60, 2560x812@60, 2560x816@60.

3. Menu Orientation

MENU

SMPTE: This option includes 23 kinds of common output resolutions: 487i@60, 576i@50, 483P@60, 576P@50, 720P@23.98, 720P@24, 720P@25, 720P@29.87, 720P@30, 720P@50, 720P@59.94, 720P@60, 1080i@50, 1080i@59.94, 1080i@60, 1080P@23.98, 1080P@24, 1080P@25, 1080P@29.97, 1080P@30, 1080P@50, 1080P@59.94, 1080P@60.

TIME CODE: Include the following items:

POSITION: User can custom the position of time code.

COUNT: Choose Start, the time will display on both the touch screen and LED display synchronously, user can check if the if signal on LED display is delay.

MOTION: Choose ON, the test pattern will move to the top left corner. While choose OFF, the test pattern will be static.

GENLOCK HS VS: User can choose HS or VS.

GENLOCK Y: Choose ON, VGA no output.

SYSTEM

Choose [SYSTEM], the touch screen shows level 2 menus as follows:

SN: 0030

TOP MCU VERSION: V1.20

BOTTOM MCU VERSION: V1.16

FPGA VERSION: V1.03

BOARD TEMPERATURE: 41° C, 105° F

BATTERY VOLTAGE: 7.13V 63%

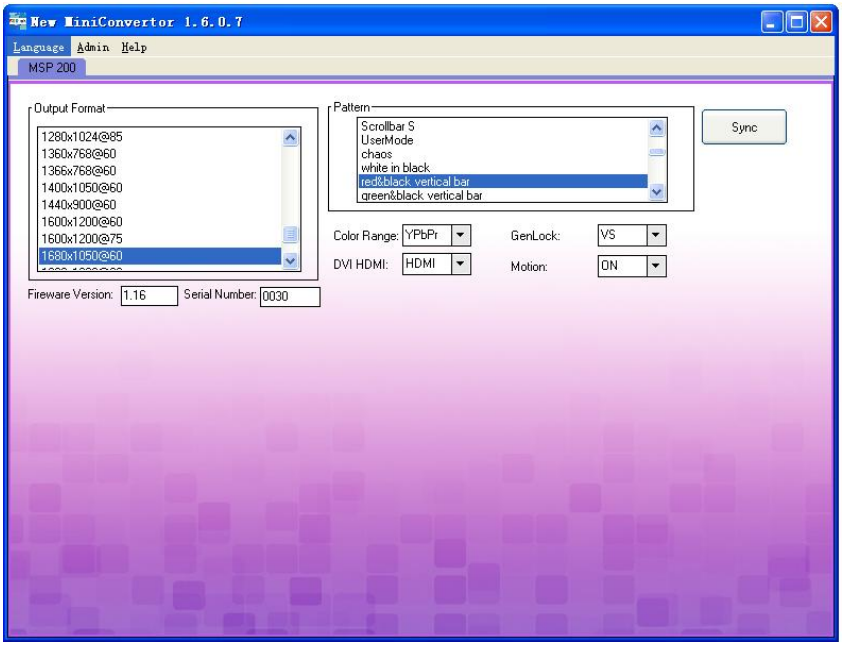
4. Communication Software Guideline

AVMSP series mini converter is equipped with user-friendly communication control software. User can set the audio display source and so on.

Running Software

Double-click AVMSP software

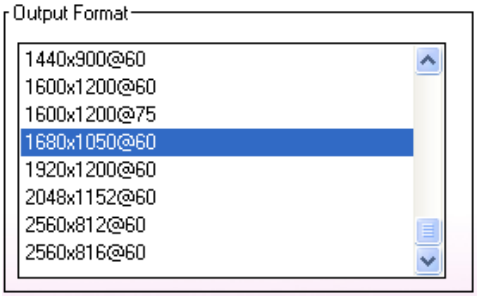
, MSP 200 software interface is shown as follows:



Use

Output Format

User can choose different output resolutions by selecting from pull down list. MSP 200 provides 23 kinds of output resolutions.

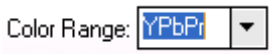


Pattern

User can choose different test patterns by selecting from pull down list. MSP 200 provides 13 kinds of patterns.

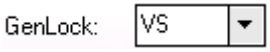
Color Range

User can choose YPbPr or RGB.



Genlock

User can choose HV or VS.

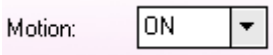


DVI HDMI

User can choose DVI or HDMI.

Motion

User can open or cancel this function.



Firmware Version

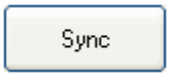
Show the current device version information, the current version is 1.16 as shown below:

Serial Number

Show the current device serial number:

SYNC

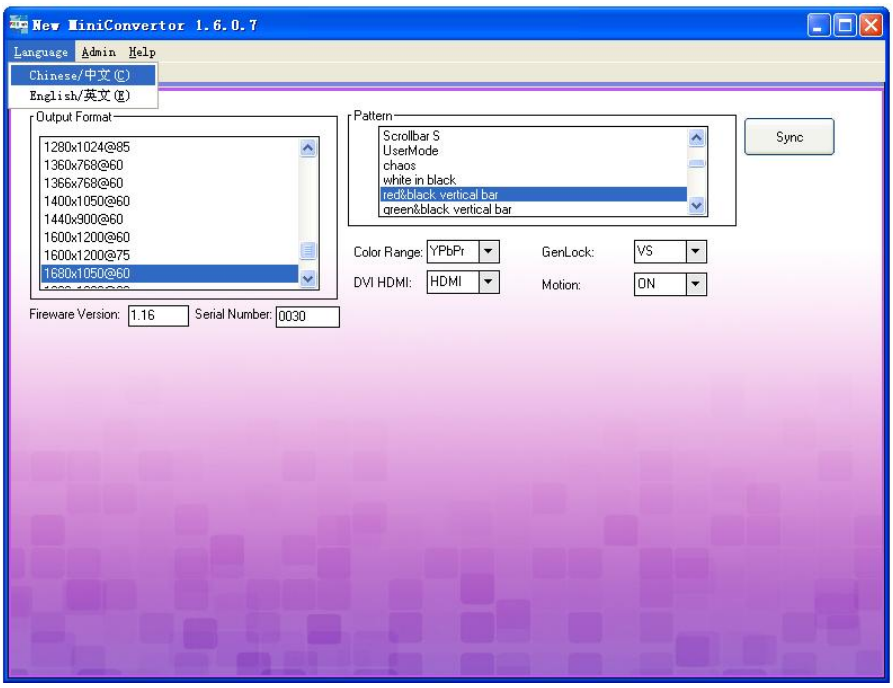
Click Sync, the interface will show the current status.



[Video Processor] Options

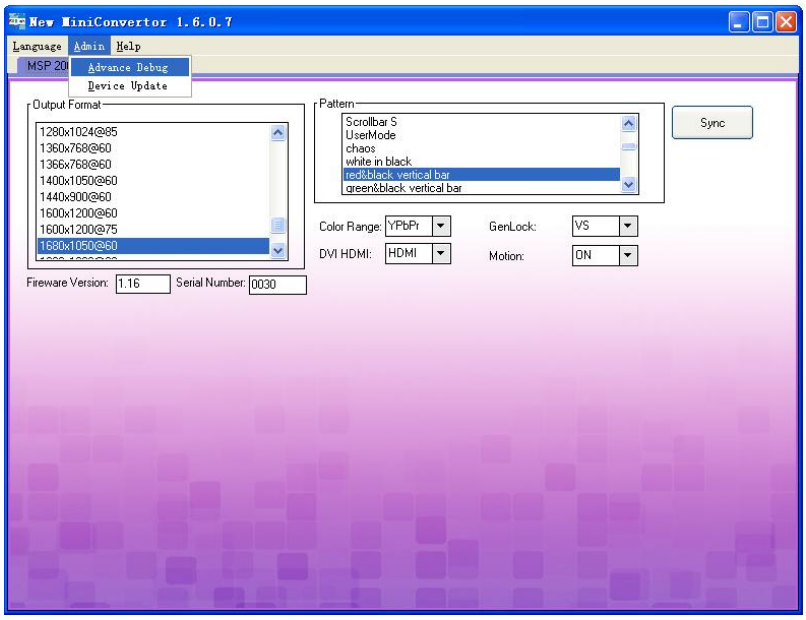
Language

This software supports both Chinese and English, User can switch the language by “Language” option.

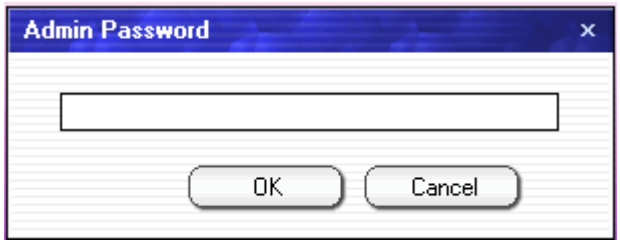


Admin

Including “Advance Debug” and “Device Update”:



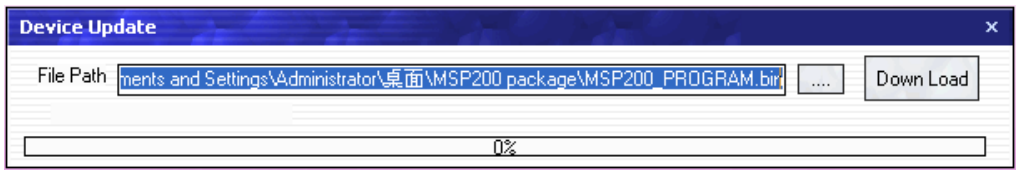
Advance Debug： User should input the password in the “Admin Password” dialog for advance debug.



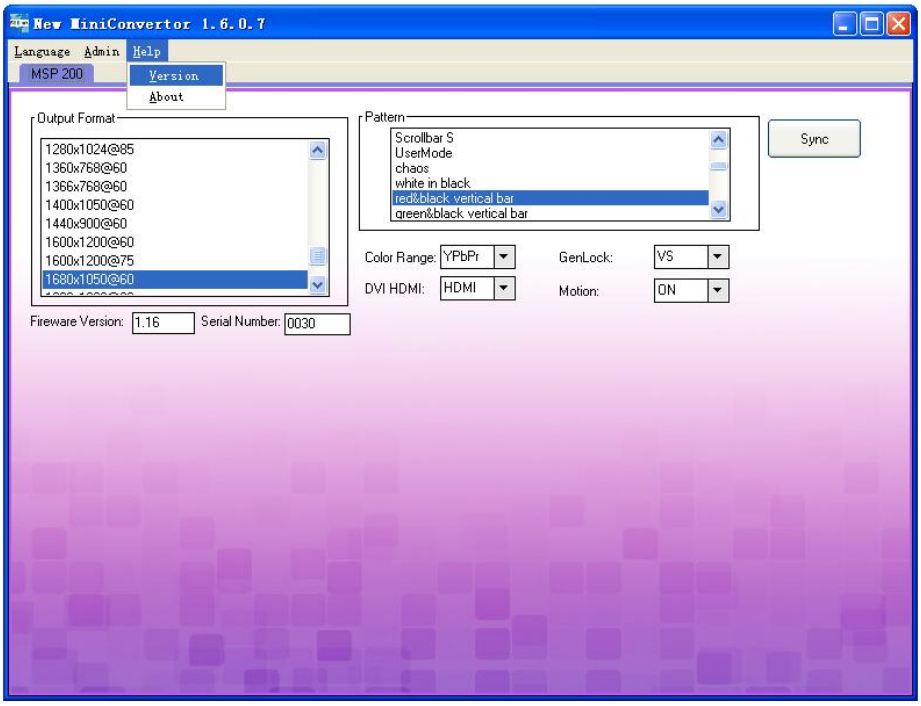
Note

Advance is only done by engineer. If need, please connect us for password.

Device Update:



Help



Version: Show the content of software update.

About: Show software version and company information.

A. Specification

SDI output	
Number of outputs	1
Connector	BNC interface
Supported Resolution	SMPTE 486i@59.94, 576i@50，720P@23.98，720P@24，720P@25，720P@29.97，720P@30，720P@50，720P@59.94，720P@60，1080i@50， 1080i@59.94， 1080i@60， 1080P@23.98，1080P@24， 1080P@25， 1080P@29.97， 1080P@30，1080P@50，1080P@59.94，1080P@60.
Equalization	Belden 1694A 100m HD 1.485G, 300m SD 270Mbps
CVBS Output	
Number of outputs	1
Signal Level	PAL/NTSC
Equalization	1Vpp±3db (0.7V Video+0.3v Sync) 75 ohm
Supported Resolution	SMPTE 486i@59.94，576i@50.
Genlock Output	
Number of outputs	2
Connector	BNC interface
DVI Output	
Number of outputs	1
Connector	Standard DVI-I Socket
Signal Level	TMDS pw, 165MHz bandwidth
Supported Resolution	VESA: 800x600@60，800x600@75，800x600@80，1024x768@60，1024x768@75，1024x768@80，1280x1024@60，1280x1024@75，1280x1024@80，1600x1200@60. SMPTE 486i@59.94，576i@50，486P@59.94，576P@50，720P@23.98，720P@24，720P@25，720P@29.97，720P@30，720P@50，720P@59.94，720P@60，1080i@50，1080i@59.94，1080i@60，1080P@23.98，1080P@24，1080P@25，1080P@29.97，1080P@30，1080P@50，1080P@59.94，1080P@60.
VGA Output	
Number of outputs	1
Connector	Standard DB15 Socket
Supported Resolution	VESA: 800x600@60， 800x600@75，800x600@80，1024x768@60，1024x768@75，1024x768@80，1280x720@60，1280x1024@60，1280x1024@75，1600x1200@60，1920x1080@60.

Signal Level	R、G、B、Hsync、Vsync:0 to1Vpp±3dB (0.7V Video+0.3v Sync) 75 ohm black level: 300mV Sync-tip: 0V
Format Conversion	No support
Frame Rate Conversion	No Support
Extras	
Assignment control	USB or dial switch
Power Supply	Battery S-8972, LIB 7.2V, 6.6Ah 47wh, compatible with SONY NP-F970 NP-F770
Working Environment	0°C~45°C
Stored Environment	10% to 90%
Product Warranty	3 years parts and labor warranty

B. Contact Information

Warranty:

All video products are designed and tested to the highest quality standard and backed by full 3 years parts and labor warranty. Warranties are effective upon delivery date to customer and are non-transferable. RGBlink warranties are only valid to the original purchase/owner. Warranty related repairs include parts and labor, but do not include faults resulting from user negligence, special modification, lighting strikes, abuse(drop/crush), and/or other unusual damages.

The customer shall pay shipping charges when unit is returned for repair.

Headquarter: S603~604 Weiye Building Torch Hi-Tech Industrial Development Zone Xiamen, Fujian Province, P.R.C.

- **Tel:** +86-592-5771197
- **Fax:** +86-592-5771202
- **Customer Hotline:** 4008-592-315
- **Websites:**
  - ~ http://www.rgblink.com
  - ~ http://www.rgblink.cn
- **E-mail:** support@rgblink.com